

The background of the slide is a complex, abstract geometric composition of overlapping, semi-transparent polygons in various shades of blue, ranging from light sky blue to deep navy blue. The shapes are angular and layered, creating a sense of depth and movement.

Inflation Gyration

Inflation Is A Problem Over Ten Years.
Not Ten Months

September 2022

Henry Neville & Teun Draaisma

www.man.com/maninstitute/the-road-ahead

Context – *Fire & Ice*

The Short-Term Picture: Inflation Rollover

The Long-Term Picture: Secular Inflation

Portfolio Implications of Short-Term DISINFLATION

Portfolio Implications of Long-Term FIRE

Conclusion

Fire & Ice – Our Recent Work

We've been thinking about the impact of inflation on asset prices for a long time



What Causes Inflation?

Inflation Regime Roadmap
June 2020

Teun Draaisma, Ben Funnell and Henry Neville from Man Group's DNA team study the history of inflationary regimes, and conclude that current extremes in deflation, inequality, debt and globalisation could lead to several major transitions in the next decade: from monetary to fiscal; from capital to labour; from more to less globalisation; and from deflation to inflation. The team provides a detailed roadmap to monitor progress towards this new inflationary regime, as well as a description of the potential dramatic changes in the investment landscape, prompting shifts from growth to value; from paper to real assets; and from traditional to alternative assets.

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www.man.com/dna
www.man.com/maninstitute

Published June 2020 (CPI @ 0.6%)

<https://www.man.com/maninstitute/inflation-regime-roadmap>

How Do Assets Perform In Inflation?

the journal of PORTFOLIO management
volume 47
number 8
AUGUST 2021
jpm.pm-research.com

WINNING ARTICLE 2022
THE BERNSTEIN FABOZZI
the journal of PORTFOLIO management
JACOBS LEVY AWARDS

The Best Strategies for Inflationary Times
Henry Neville, Teun Draaisma, Ben Funnell,
Campbell R. Harvey, and Otto Van Hemert

First Published on SSRN March 2021 (CPI @ 2.6%)

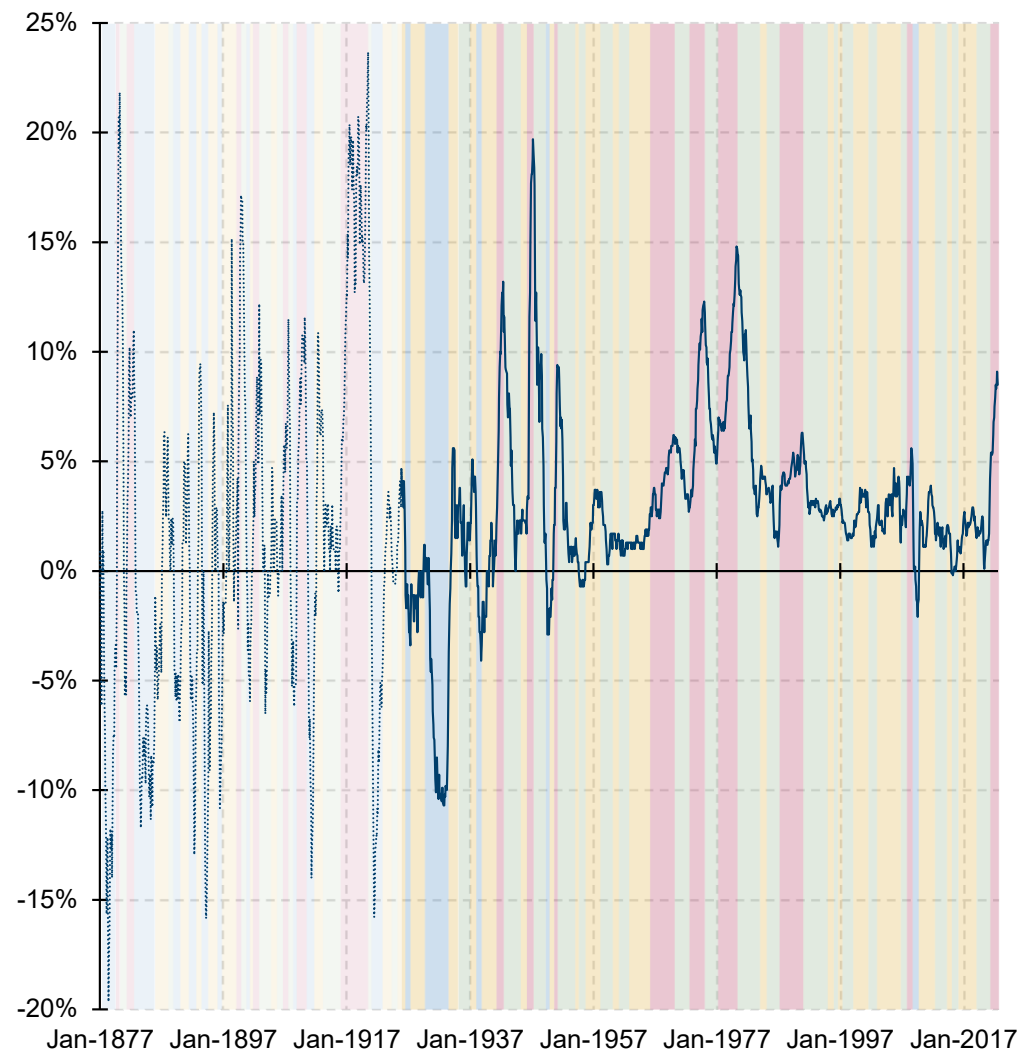
Published in JPM August 2021

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3813202

The Fire & Ice Framework

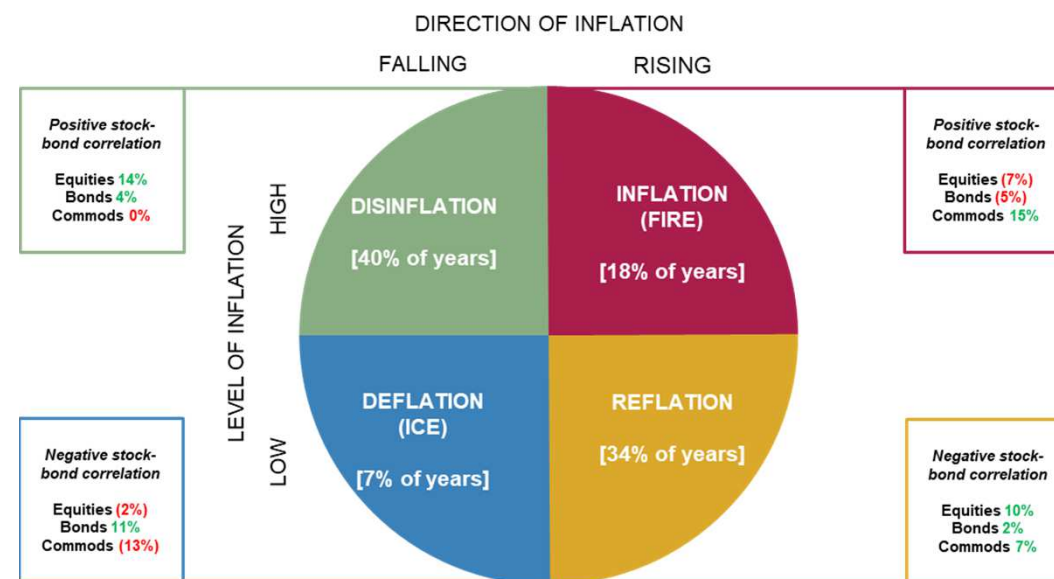
The level AND the direction of inflation are TOGETHER the key determinant of asset price moves

Historic Inflation Episodes



— FIRE — ICE — DISINFLATION — REFLATION — Headline CPI YoY (%)

Average Asset Returns In The 4 Inflation Quadrants (1926-Now)

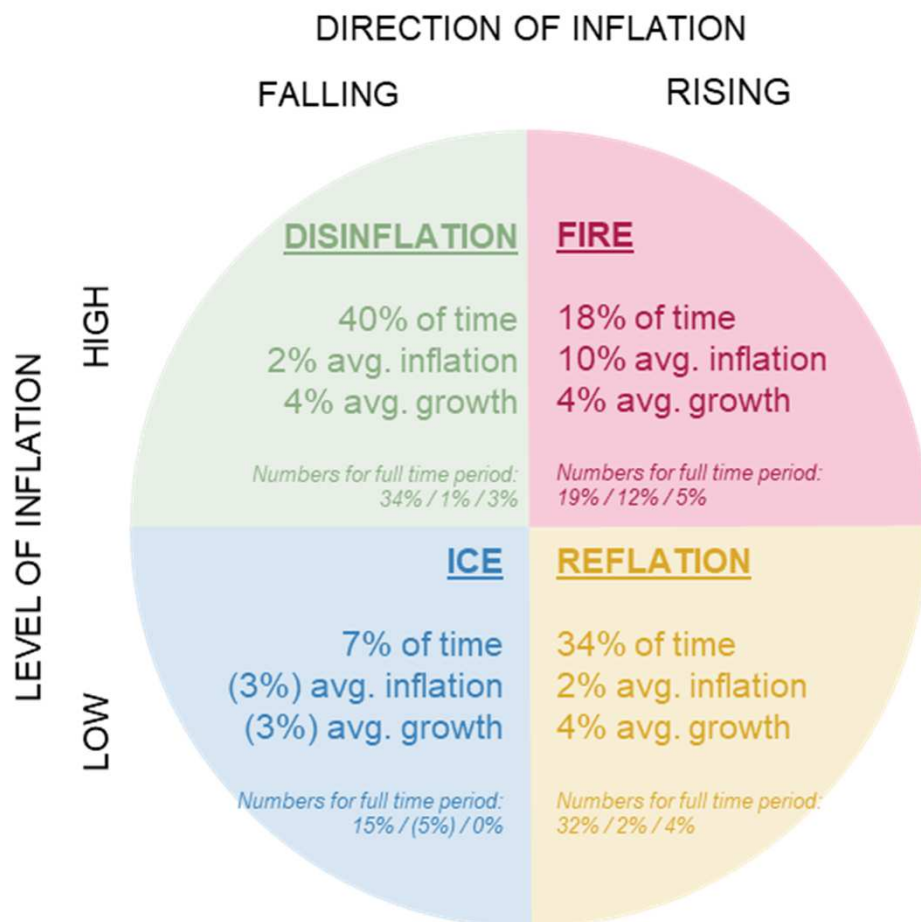


Sources: (L) Inflation from Professor Shiller's database. Inflation regimes defined by the DNA team according to the following rules. FIRE: where CPI YoY moves above 2%, through 5% and peaks. ICE: where CPI moves below 1%, then below -1%, ending either at the trough, or where it goes back through -4%. DISINFLATION: where CPI is falling on a trailing 12 month basis, and is not either FIRE or ICE. Also assume that DISINFLATION cannot follow ICE. REFLATION: where CPI is rising on a trailing 12 month basis, and is not either FIRE or ICE. Also assume that REFLATION cannot follow FIRE. Right: As of June 2022. All returns are real annualized. Source: Man DNA team using data from Professor Shiller, Fama-French and Morgan Stanley

FIRE Is A Highly Challenging Regime

Lessons from 100 years of history across a broad range of assets

FIRE Returns Detail



SINCE 1926
Equities: (7%)
Bonds: (5%)
60/40: (6%)
Commod: 15%

FULL HIST.
Equities: (8%)
Bonds: (7%)
60/40: (7%)
Commod: 13%

EQ SECTORS
Staples: (6%)
Disc.: (15%)
Manu: (8%)
Energy: 1%
Chems.: (6%)
Tech: (9%)
Comms: (7%)
Utils: (9%)
Retail: (9%)
Health: (1%)
Fins: (9%)

EQ L/S STYLES
Small Size: (4%)
Value: (1%)
Profitability: (1%)
Cons. Invest.: 2%
XS Mom.: 8%
Quality: 3%
Low Beta: (3%)

BD DURATION
UST 30: (8%)
UST 10: (5%)
UST 2: (3%)
TIPS: 2%

CREDIT
IG: (7%)
HY: (7%)

COMM. GROUPS
Industrials: 19%
Precious: 11%
Agris: 9%
Softs: 8%
Livestock: 7%
Energies: 31%

Trend: 25%
Gold: 13%
Wine: 5%
Resi RE: (2%)

CPI moves from 2% to 11%
Over full time period from 2% to 13%

As of June 2022. All returns are real total return annualised. Sources: Equities are the S&P 500 using Professor Shiller's data. Bonds are UST10 from GFD. 60/40 is the monthly rebalanced 60% equity, 40% bonds portfolio. Commodities are proxied by an equal weight portfolio of all futures contracts as they appear through history. From 1877 to 1946 this is based off work done by AQR. From 1946 we use returns data from the Man AHL database. Sectors are based off the 12 Fama-French industry portfolios. Similarly styles are the Fama-French portfolios (SMB, HML, RMW, CMA and Mom. Respectively), apart from Quality and Low Beta which are AQR (QMJ and BAB). Duration returns from GFD. TIPS prior to 1997 based off a backcast by William Marshall at Goldman Sachs, otherwise Bloomberg. Credit portfolios constructed by the DNA team from data provided by Morgan Stanley. Wine returns from Credit Suisse to 2001, and then the Liv-Ex 100 Fine Wine benchmark. Residential RE is based of the Case-Shiller index. For further details on regimes and asset returns, please see our paper, The Best Strategies for Inflationary Times, available here: <https://papers.ssrn.com/abstract=3813202>

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The Long-Term Picture: Secular Inflation

Portfolio Implications of Short-Term DISINFLATION

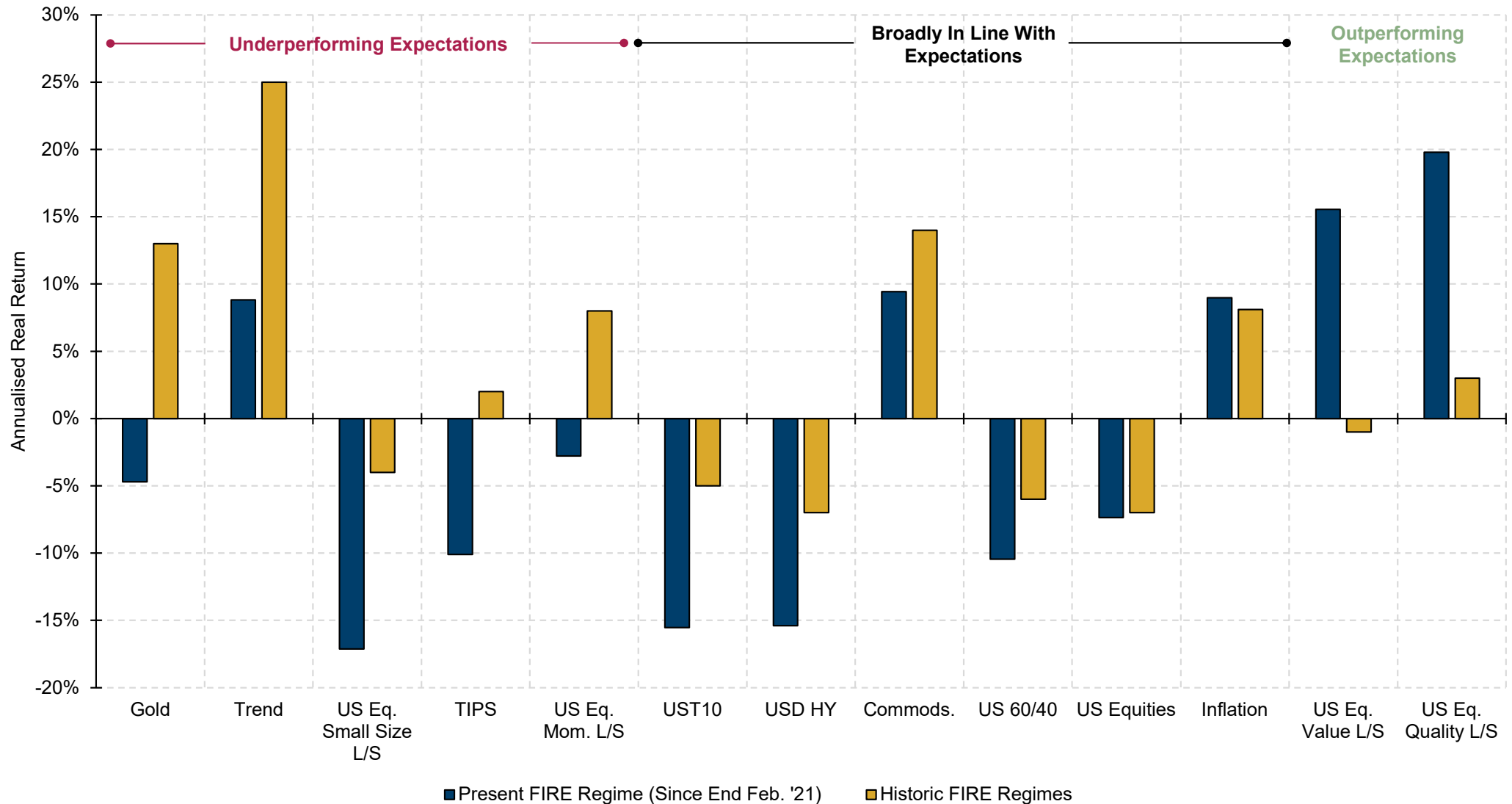
Portfolio Implications of Long-Term FIRE

Conclusion

The Story So Far In The Most Recent FIRE Episode



Real Annualised Returns In Current FIRE Episode (Feb-21 To Jun-22) And Performance In Historic FIRE Episodes

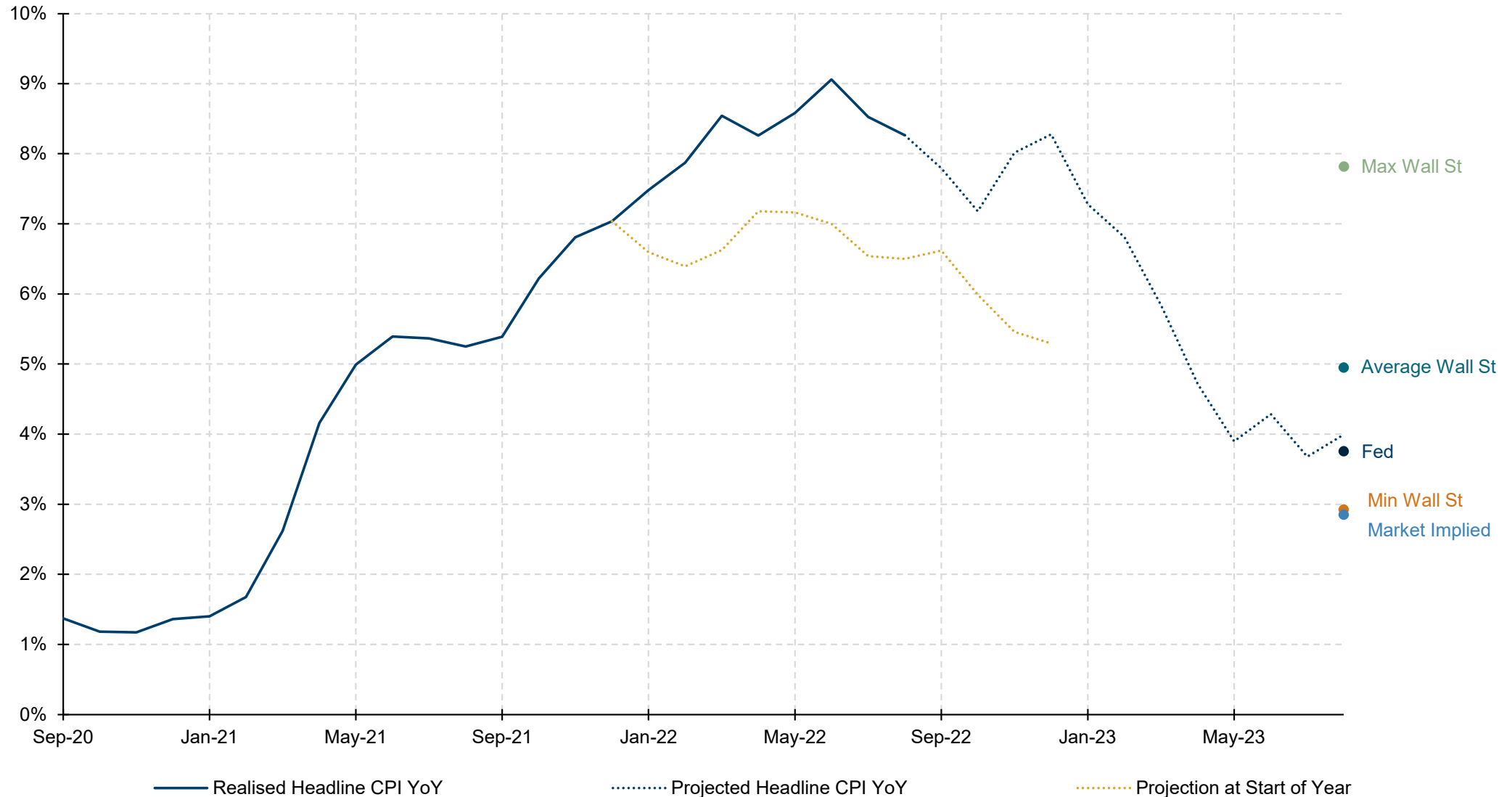


Source: As per slide 4. The current period is confirmed as an inflationary period as per the definition in *The Best Strategies for Inflationary Times*, the end of the regime (determined by the peak rate of inflation) is yet to be determined. All returns above for this episode to end June 2022. For further details on regimes and asset returns, please see here: <https://papers.ssrn.com/abstract=3813202>

Our Inflation Projection Model Suggests Near Term **DISINFLATION**



1Y Forward Inflation Projection (Headline CPI YoY) With Market Expectations



Source: Bureau of Labor Statistics, Bloomberg, Man DNA team calculations. We model Food At Home as an equal weight index of futures in wheat, lean hogs, live cattle, milk, orange juice, coffee, sugar, cocoa and soybean oil. We model Used Vehicles as the Manheim US Used Vehicle Auction Prices index, reported by Bloomberg. We model Rent and OER using the Case-Shiller US all-city house price index. We model Energy using a basket of futures in gasoline, natural gas and coal. Where not directly modelled all categories are assumed to revert to the seasonal pattern of the last cycle (2009-19)

This Bear Market In The Context Of History

If this inflation episode is over, and this bear market is over, then the Fed have got off lightly

21 US Bear Markets Of The Last 100 Years



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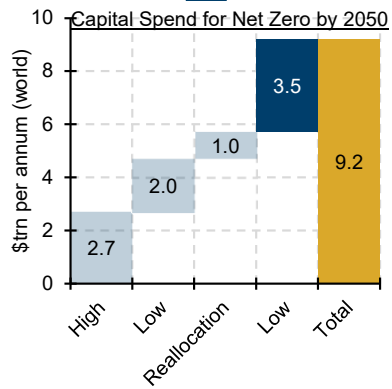
Portfolio Implications of Long-Term FIRE

Conclusion

ENERGY



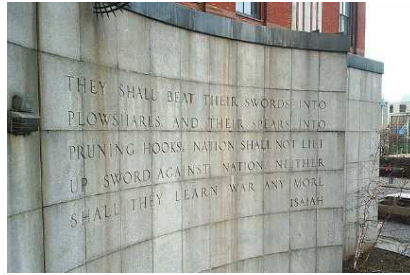
Brown



Green



DEFENCE



Peace Dividend



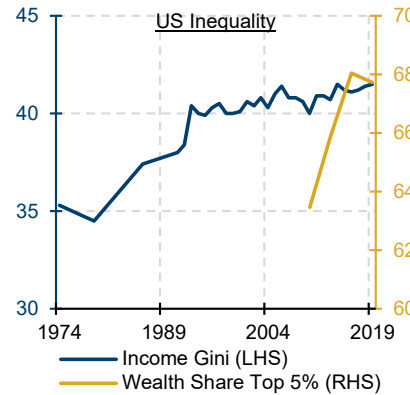
Tooling Up



INEQUALITY



Invisible Hand



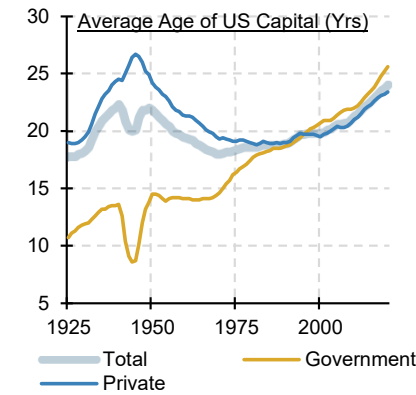
Fiscal Intervention



INFRASTRUCTURE



Old



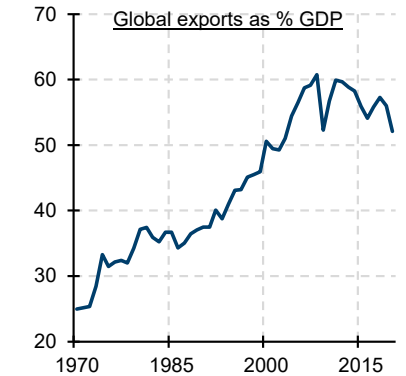
New



SUPPLY CHAIN



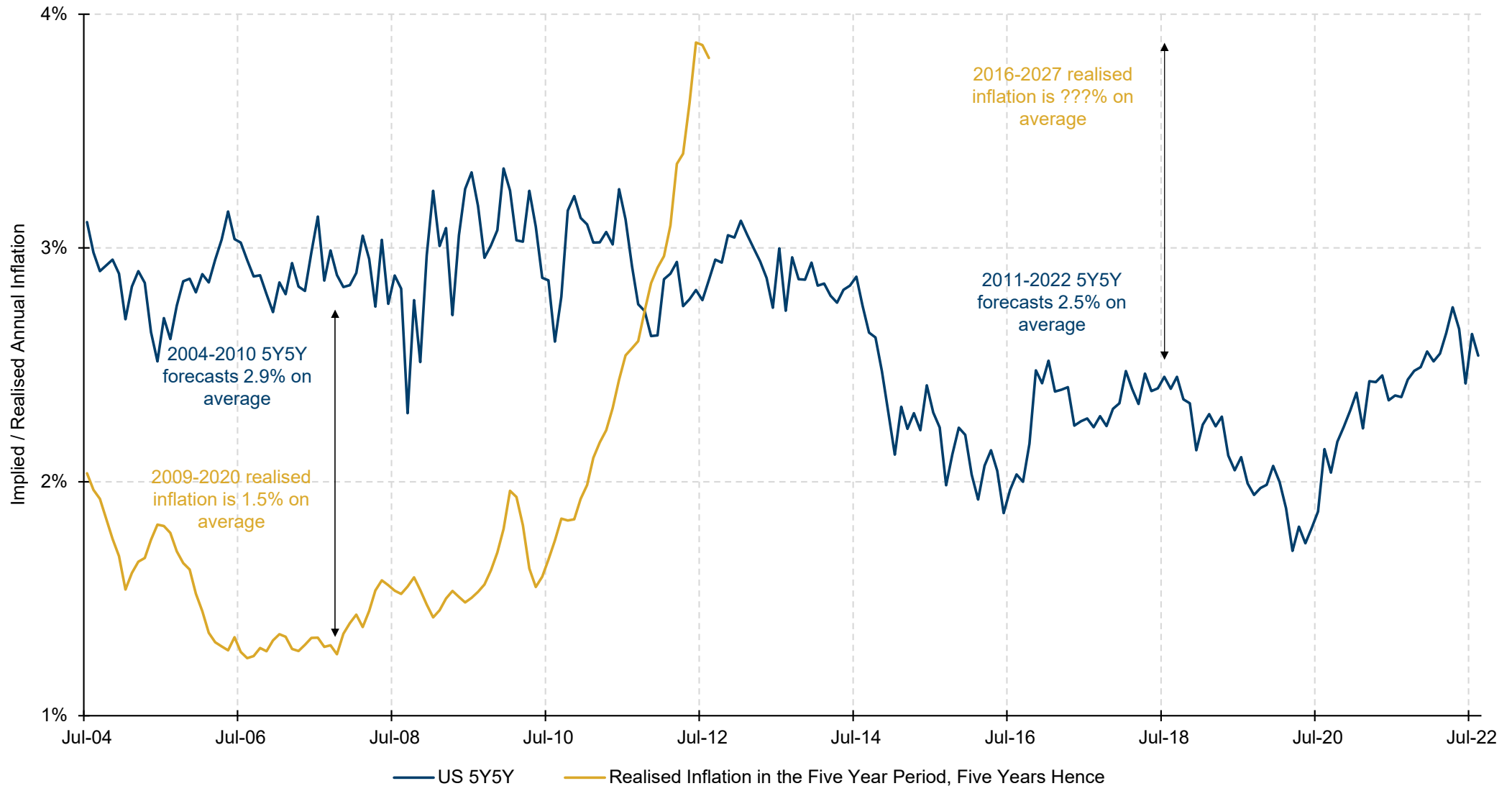
Just In Time



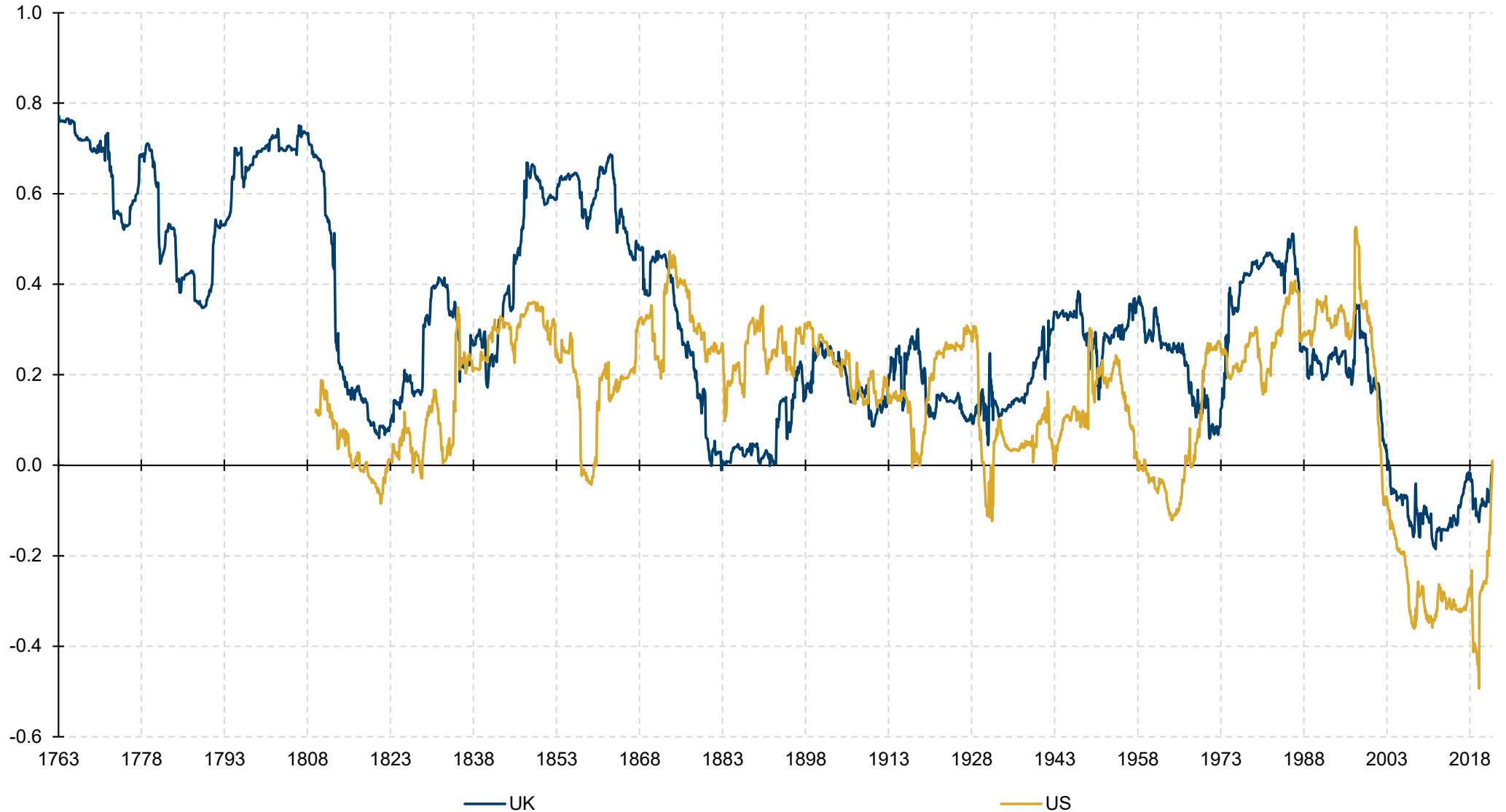
Just In Case



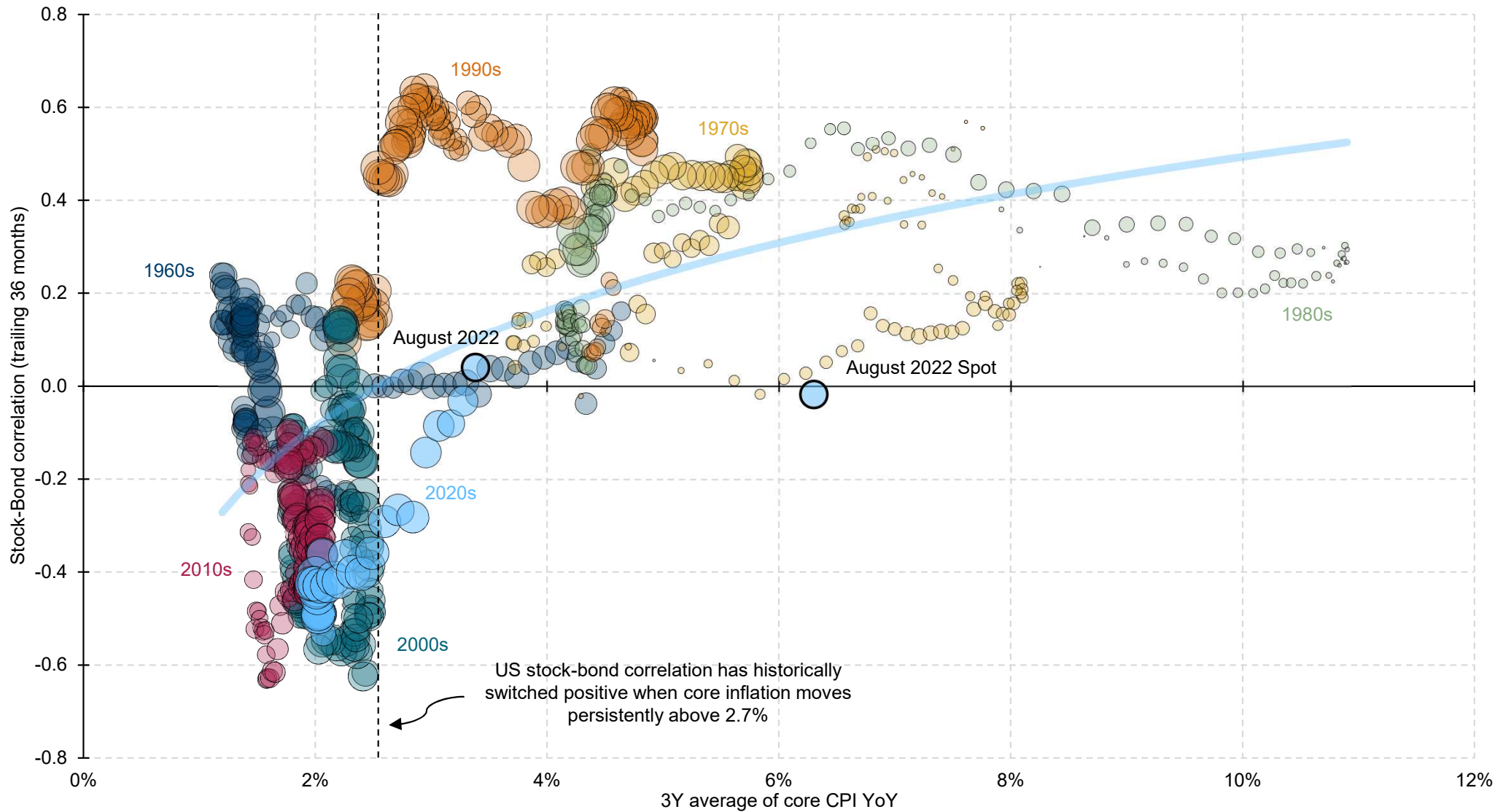
The Forecasting Record Of The 5Y5Y



Slow Stock-Bond Correlation Measure (Trailing Ten Years, Monthly Periodicity)



US Stock-Bond Correlation And Inflation: Size Of Bubble Is Equity Valuation (Larger = More Expensive)



Source: Stock-bond correlation is between the S&P 500 Total Return and the Bloomberg Barclays US Treasury Aggregate Total Return indices. Valuation calculated as the percentile monthly P/E from January 1960 to August 2022. Core CPI from the Bureau of Labor Statistics

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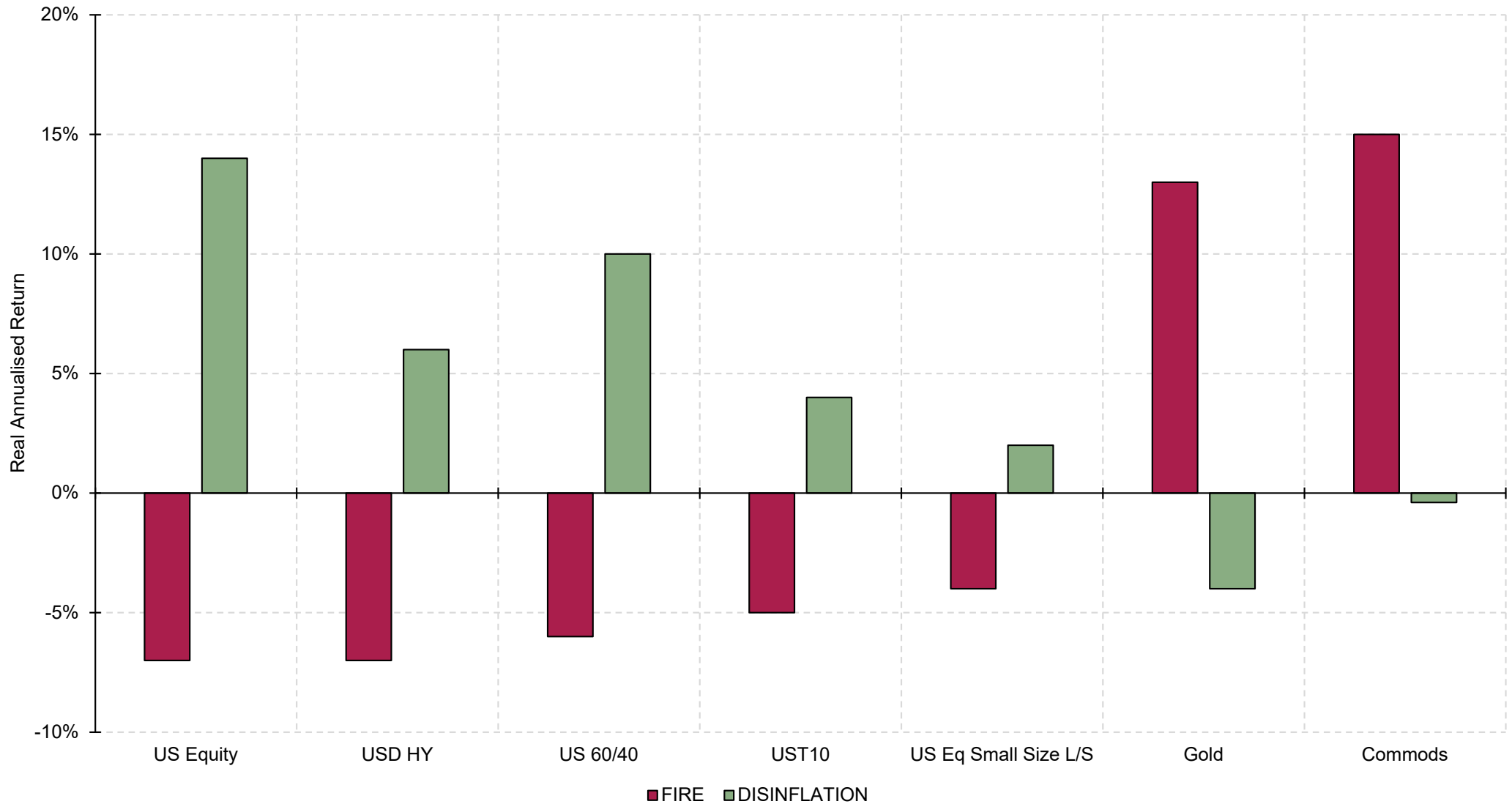
The Long-Term Picture: Secular Inflation

Portfolio Implications of Short-Term DISINFLATION

Portfolio Implications of Long-Term FIRE

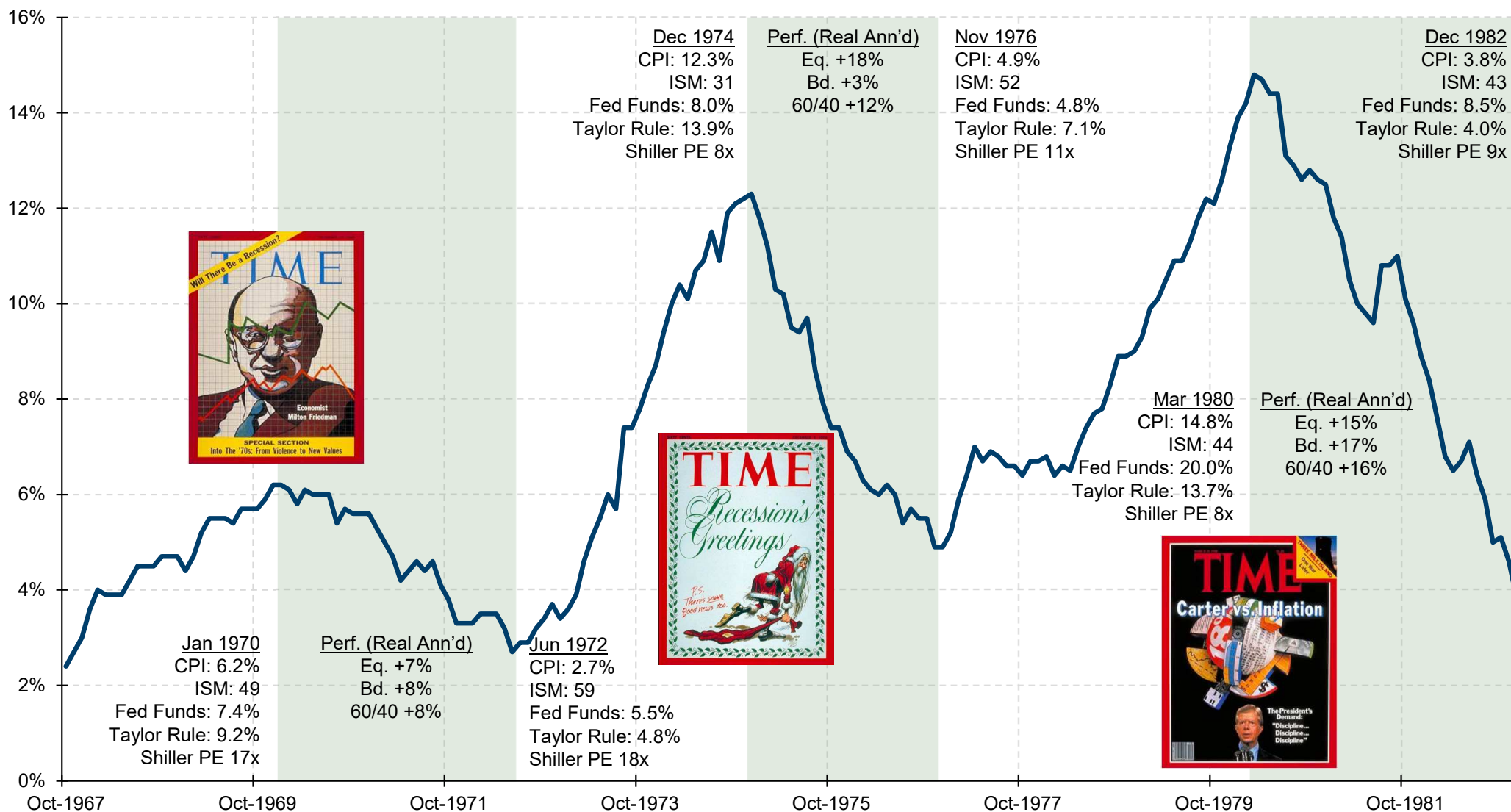
Conclusion

Average Performance of Selected Assets In FIRE And DISINFLATION (1926 – Present)



DISINFLATION Episodes Are Often Good For Risk Assets

US Headline YoY CPI Through The 1970s



Context – *Fire & Ice*

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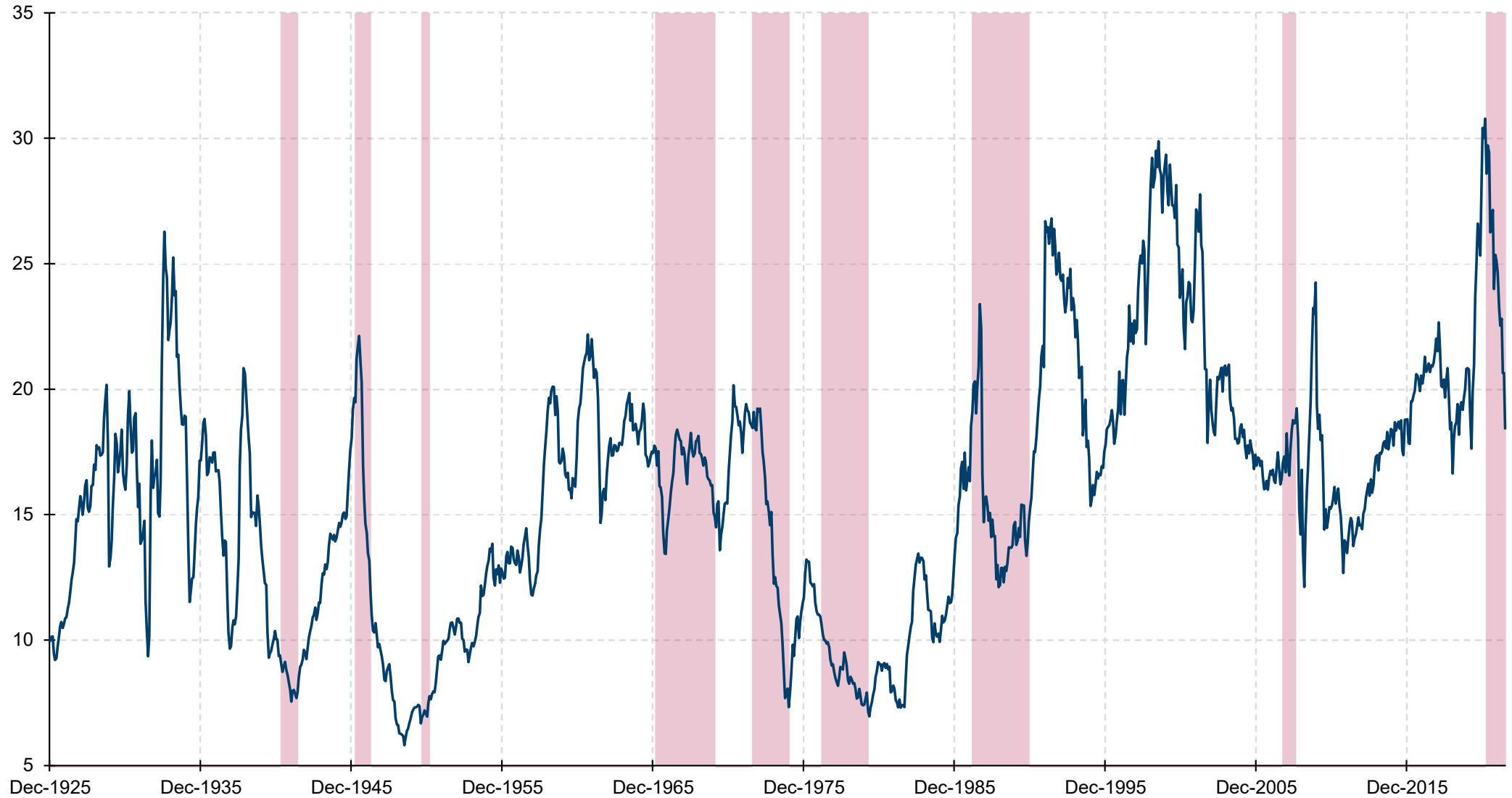
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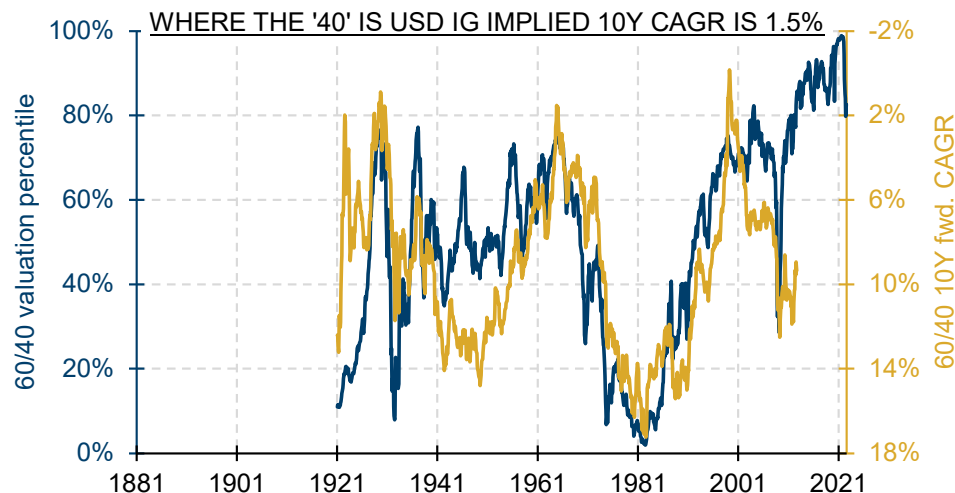
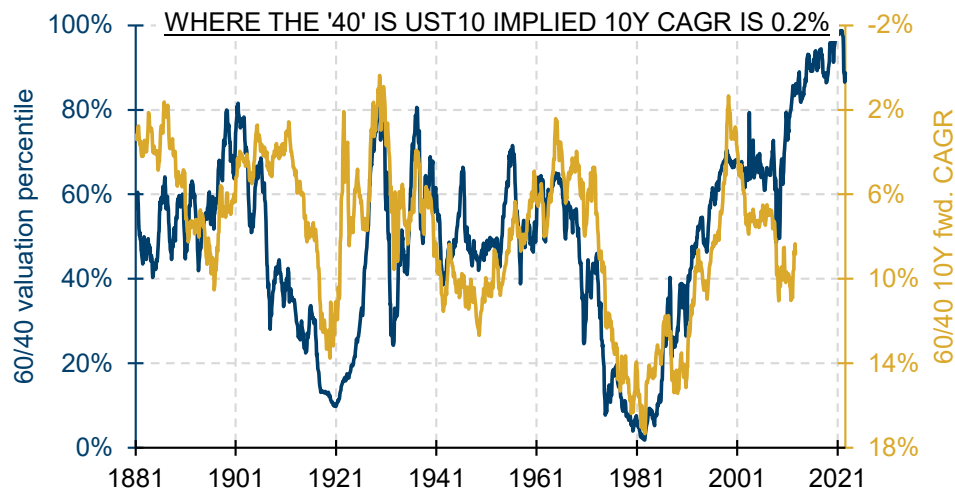
Conclusion

The Multiple Corrects Sharply In Most FIRE Episodes

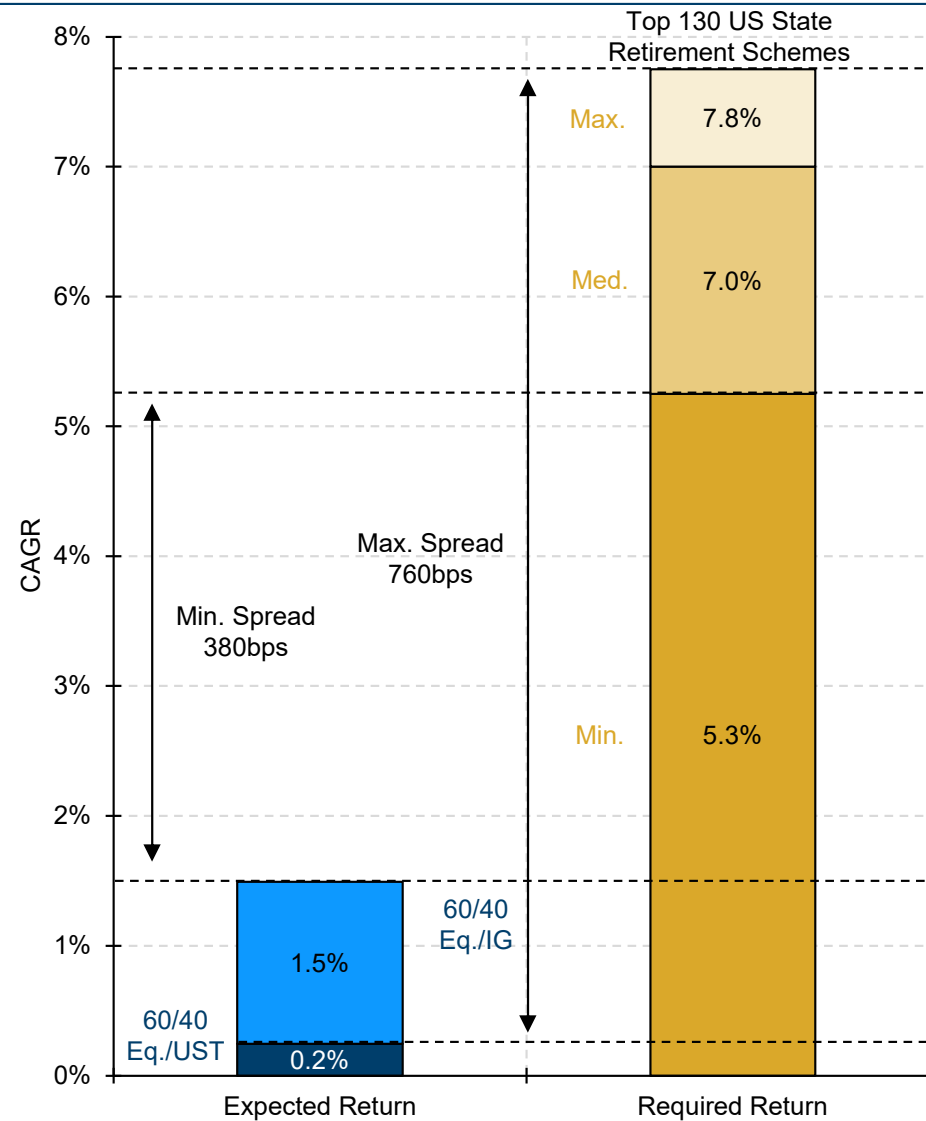
US Trailing 12M P/E Overlaid with DNA FIRE Episodes



60/40 Valuation Percentiles And Implied 10Y Returns...



...Compared With US Pension Fund Return Requirements



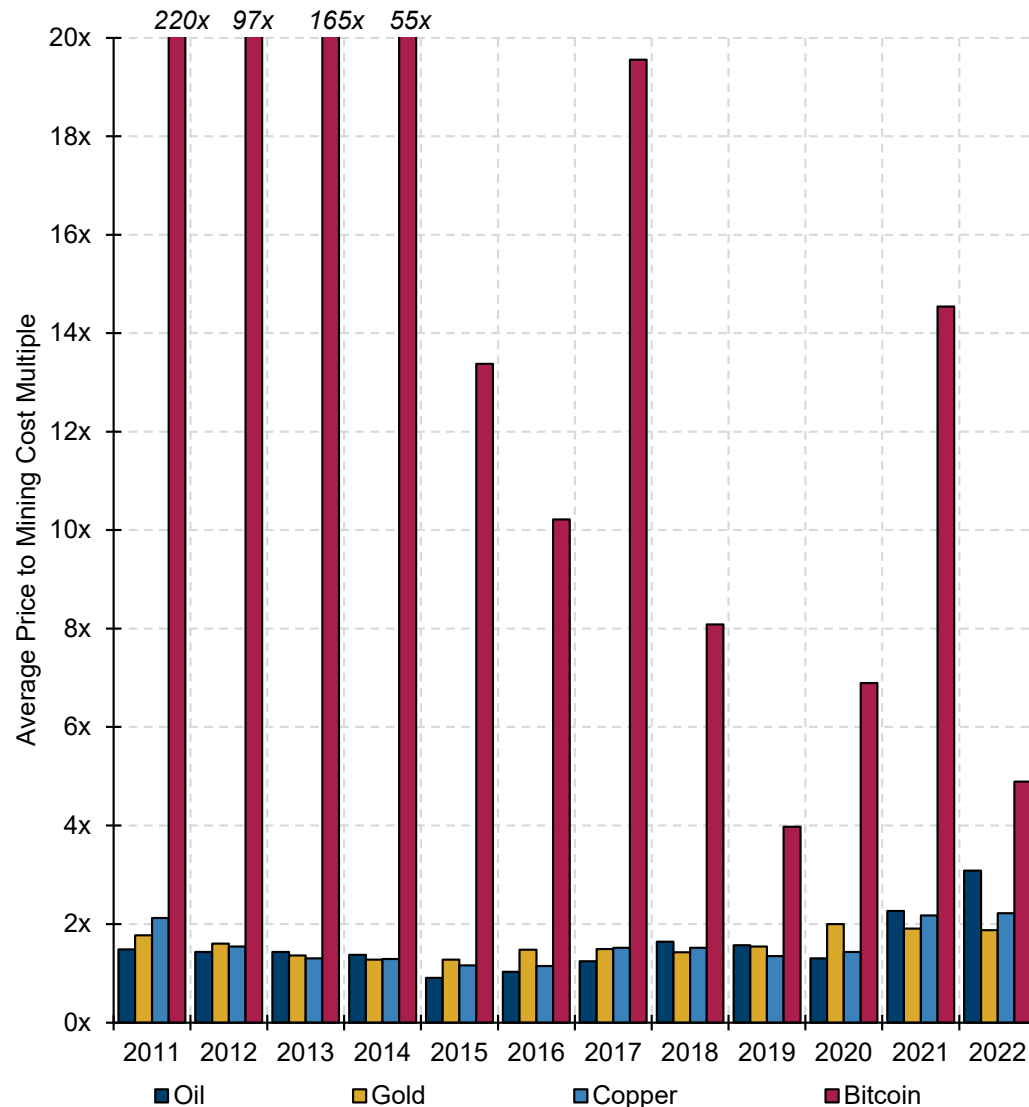
Source: (L) Valuation percentiles are calculated by taking the weighted average of the Shiller PE historical percentile rank and the inverse of the bond yield historical percentile rank. (R) Required return refers to the investment assumptions of the top 130 US State Retirement Schemes, as reported by the National Association of State Retirement Administrators. Data to end July 2022

Crypto: Valuations and Correlations

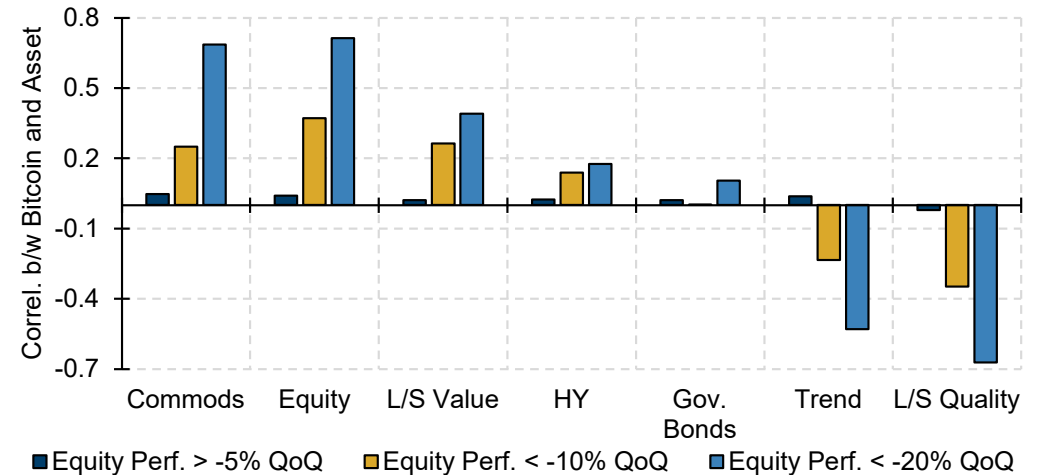
See: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4124576



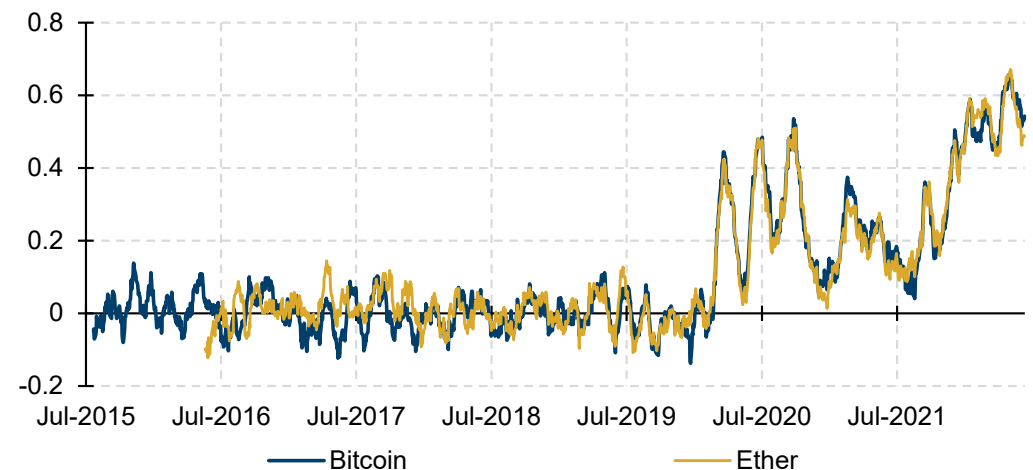
Price To OPEX Multiple



Bitcoin Correlations Where Markets Are Selling Off



Crypto Correlation With S&P 500 Futures (20 Day, 15 Min)

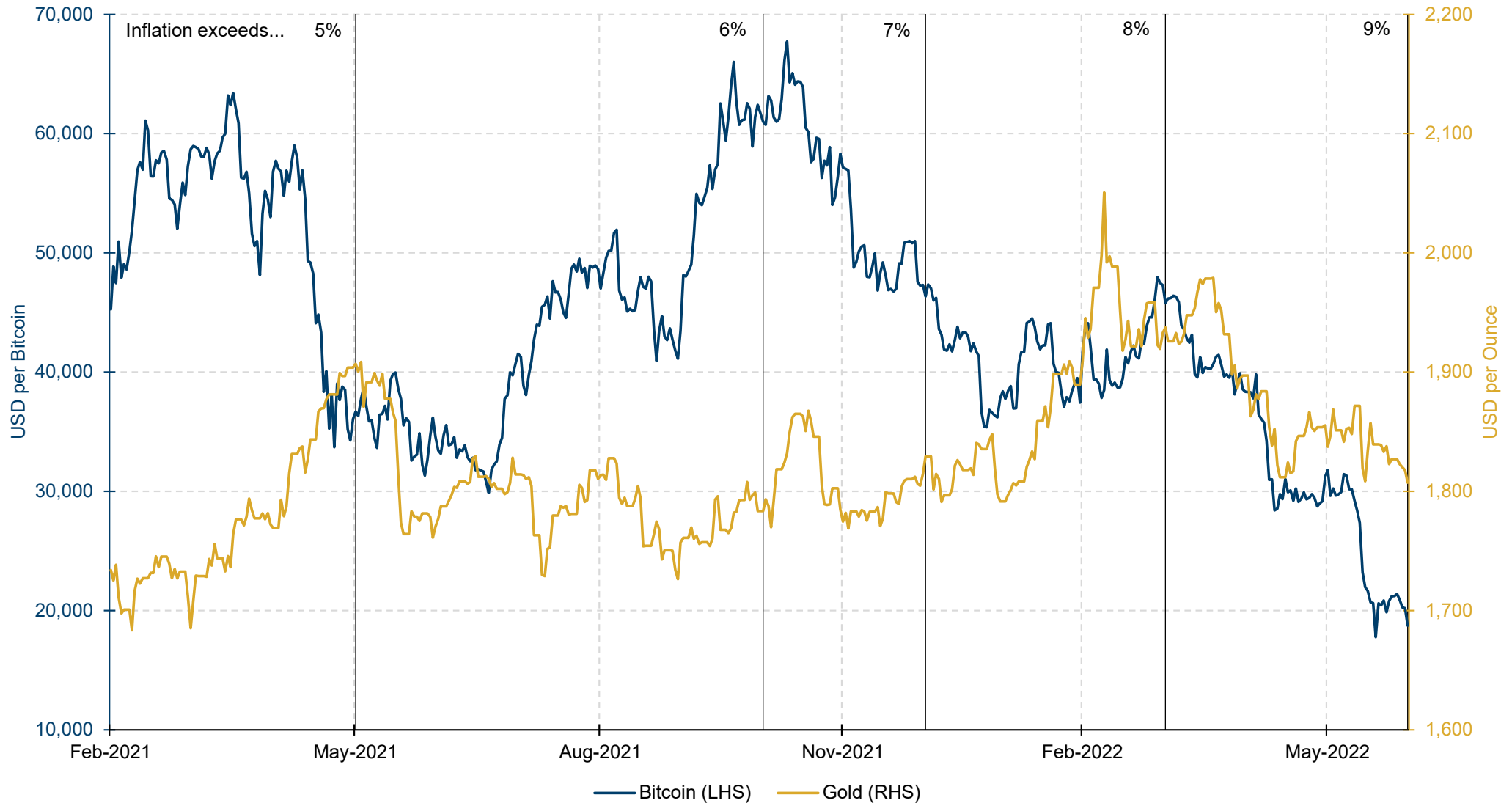


Source: (L) Blockchain.com, Küfeoğlu and Özkuran (2019), Song and Aste (2020). Cost of production for oil, gold and copper collated by Morgan Stanley. For oil we proxy the marginal barrel using US shale, the swing producer of the last decade. For gold and copper we use C1 cash cost, at the 90th percentile of the cost curve. The y-axis is cut off at 20x for legibility. This data is as of July 2022. (TOP RIGHT) Bloomberg. (BOTTOM RIGHT) Man AHL

Crypto As An Inflation Hedge

See: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4124576

Crypto and Gold During Current FIRE Episode



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- **The level AND the direction of inflation are TOGETHER, the key determinants of asset moves**
 - The majority of the last two decades has been either **REFLATION** (low and rising inflation) or **DISINFLATION** (high and falling inflation)
 - These two episodes are generally very good for traditional multi-asset portfolio calibrations. **FIRE** (high and rising inflation) is not

- **A new EPISODE of high and rising inflation (FIRE) began in February 2021 and PROBABLY ended in June 2022...**
 - If this **FIRE** episode is over, and this bear market is over, then the Fed has got off lightly, relative to history

- **...But a new REGIME of higher and more volatile inflation will likely persist for a decade or more**
 - 5 secular drivers argue for a clustering of **FIRE** episodes interspersed with **DISINFLATION**
 - For multi-asset investors the biggest way this will be felt will be through positive stock-bond correlations

- **The transition from FIRE to DISINFLATION (high and falling inflation) has historically been a good time to be risk-on**
 - The **FIRE** and **DISINFLATION** transition requires considerable dexterity in portfolio construction

- **In general, the longer term expectation of a clustering of FIRE has profound implications for traditional multi-asset**
 - They're not good
 - For equities, the multiple will likely compress further, although probably not in a straight line
 - Bitcoin isn't the answer...

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